In reply to Office Action of September 12, 2003

IN THE CLAIMS

The status of each claim is presented below.

1. (Twice Amended) A compound represented by formula (I):

wherein

X is hydrogen, halogen, trifluoromethyl, lower alkyl, unsubstituted or substituted phenyl, lower alkyl-thio, phenyl-lower alkyl-thio, lower alkyl-sulfonyl, or phenyl-lower alkyl-sulfonyl;

Y is hydrogen, hydroxyl, mercapto, lower alkoxy, lower alkyl-thio, halogen, lower alkyl, unsubstituted or substituted mononuclear aryl, or $-N(R^2)_2$;

R¹ is hydrogen or lower alkyl;

each R² is, independently, -R⁷, -(CH₂)_m-OR⁸, -(CH₂)_m-NR⁷R¹⁰,

 $-(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8$, $-(CH_2CH_2O)_m-R^8$,

 $-(CH_{2}CH_{2}O)_{m}-CH_{2}CH_{2}NR^{7}R^{10}, -(CH_{2})_{n}-C(=O)NR^{7}R^{10}, -(CH_{2})_{n}-Z_{g}-R^{7}, -(CH_{2})_{m}-NR^{10}-R^{10}+R^{1$

 $CH_2(CHOR^8)(CHOR^8)_n$ - CH_2OR^8 , - $(CH_2)_n$ - CO_2R^7 , or

$$-(CH_2)_n$$
 O R^7

In reply to Office Action of September 12, 2003

R³ and R⁴ are each, independently, hydrogen, a group represented by formula (A), lower alkyl, hydroxy lower alkyl, phenyl-lower alkyl, (halophenyl)-lower alkyl, lower-(alkylphenylalkyl), lower alkoxyphenyl)-lower alkyl, naphthyl-lower alkyl, or pyridyl-lower alkyl, with the proviso that at least one of R³ and R⁴ is a group represented by formula (A):

$$--(C(R^{L})_{2})_{0}-x-(C(R^{L})_{2})_{p}- Q = Q OH$$

$$Q = Q OH$$

wherein

each R^L is, independently, $-R^7$, $-(CH_2)_n$ -OR⁸, -O- $(CH_2)_m$ -OR⁸,

 $-(CH_2)_n-NR^7R^{10}$, $-O-(CH_2)_m-NR^7R^{10}$, $-(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8$,

-O-(CH₂)_m(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸, -(CH₂CH₂O)_m-R⁸,

 $-O-(CH_{2}CH_{2}O)_{m}-R^{8},\,-(CH_{2}CH_{2}O)_{m}-CH_{2}CH_{2}NR^{7}R^{10},\\$

 $-O-(CH_2CH_2O)_m-CH_2CH_2NR^7R^{10}$, $-(CH_2)_n-C(=O)NR^7R^{10}$,

 $-O-(CH_2)_m-C(=O)NR^7R^{10}, -(CH_2)_n-(Z)_g-R^7, -O-(CH_2)_m-(Z)_g-R^7,$

-(CH₂)_n-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

 $-\text{O-}(\text{CH}_2)_{\text{m}}\text{-}\text{NR}^{10}\text{-}\text{CH}_2(\text{CHOR}^8)(\text{CHOR}^8)_{\text{n}}\text{-}\text{CH}_2\text{OR}^8,$

-(CH₂)_n-CO₂R⁷, -O-(CH₂)_m-CO₂R⁷, -OSO₃H, -O-glucuronide, -O-glucose, or

$$-O\left(CH_2\right)_{m} \xrightarrow{O} \overset{R^7}{\underset{O}{R^7}}$$
 or $-(CH_2)_{n} \xrightarrow{O} \overset{R^7}{\underset{R^7}{R^7}}$;

In reply to Office Action of September 12, 2003

each x is, independently, O, NR⁷, C=O, CHOH, C=N-R⁶, or represents a single bond;

each o is, independently, an integer from 0 to 10;

each p is, independently, an integer from 0 to 10;

with the proviso that (a) the sum of o and p in each contiguous chain is

from 1 to 10 when x is O, NR⁷, C=O, or C=N-R⁶ or (b) that the sum of o and p

in each contiguous chain is from 5 to 10 4 to 10 when x represents a single bond;

each R^6 is, independently, $-R^7$, -OH, $-OR^{11}$, $-N(R^7)_2$, $-(CH_2)_m$ - OR^8 ,

 $-O-(CH_2)_m-OR^8$, $-(CH_2)_n-NR^7R^{10}$, $-O-(CH_2)_m-NR^7R^{10}$,

 $-(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8$, $-O-(CH_2)_m(CHOR^8)(CHOR^8)_n-CH_2OR^8$,

 $-(CH_{2}CH_{2}O)_{m}-R^{8}, -O-(CH_{2}CH_{2}O)_{m}-R^{8}, -(CH_{2}CH_{2}O)_{m}-CH_{2}CH_{2}NR^{7}R^{10},$

 $-O-(CH_2CH_2O)_m-CH_2CH_2NR^7R^{10}$, $-(CH_2)_n-C(=O)NR^7R^{10}$,

 $-O-(CH_2)_m-C(=O)NR^7R^{10}, -(CH_2)_n-(Z)_g-R^7, -O-(CH_2)_m-(Z)_g-R^7,$

-(CH₂)_n-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

-O-(CH₂)_m-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

-(CH₂)_n-CO₂R⁷, -O-(CH₂)_m-CO₂R⁷, -OSO₃H, -O-glucuronide, -O-glucose,

$$-O\left(CH_2\right)_m$$
 O
 R^7
or
 $-(CH_2)_n$
 O
 R^7
 R^7

wherein when two R^6 are $-OR^{11}$ and are located adjacent to each other on a phenyl ring, the alkyl moieties of the two R^6 may be bonded together to form a methylenedioxy group;

In reply to Office Action of September 12, 2003

each R⁷ is, independently, hydrogen or lower alkyl;

each R⁸ is, independently, hydrogen, lower alkyl, -C(=O)-R¹¹, glucuronide, 2-tetrahydropyranyl, or

$$O \longrightarrow OR^{11}$$

$$O \longrightarrow OCOR^{11}$$

$$OCOR^{11}$$

$$OCOR^{11}$$

each R⁹ is, independently, -CO₂R⁷, -CON(R⁷)₂, -SO₂CH₃, or -C(=O)R⁷; each R¹⁰ is, independently, -H, -SO₂CH₃, -CO₂R⁷, -C(=O)NR⁷R⁹, -C(=O)R⁷, or -CH₂-(CHOH)_n-CH₂OH; each Z is, independently, CHOH, C(=O), CHNR⁷R¹⁰, C=NR¹⁰, or NR¹⁰; each R¹¹ is, independently, lower alkyl; each g is, independently, an integer from 1 to 6; each m is, independently, an integer from 1 to 7; each n is, independently, an integer from 0 to 7; each Q is, independently, C-R⁶; or a pharmaceutically acceptable salt thereof, and inclusive of all enantiomers, diastereomers, and racemic mixtures thereof.

2. (Previously Presented) The compound of Claim 1, wherein Y is -NH₂.

- 3. (Previously Presented) The compound of Claim 2, wherein R² is hydrogen.
- 4. (Previously Presented) The compound of Claim 3, wherein R¹ is hydrogen.
- 5. (Previously Presented) The compound of Claim 4, wherein X is chlorine.
- 6. (Previously Presented) The compound of Claim 5, wherein R³ is hydrogen.
- 7. (Previously Presented) The compound of Claim 6, wherein each R^L is hydrogen.
- 8. (Previously Presented) The compound of Claim 7, wherein o is 4.
- 9. (Previously Presented) The compound of Claim 8, wherein p is 0.
- 10. (Previously Presented) The compound of Claim 9, wherein x represents a single bond.
- 11. (Previously Presented) The compound of Claim 10, wherein each R⁶ is hydrogen.
 - 12. Canceled.
 - 13. Canceled.

In reply to Office Action of September 12, 2003

14. (Previously Presented) The compound of Claim 1, wherein

X is halogen;

Y is
$$-N(R^7)_2$$
;

R¹ is hydrogen or C₁-C₃ alkyl; and

$$R^2$$
 is $-R^7$, $-(CH_2)_m$ -OR⁷, or $-(CH_2)_n$ -CO₂R⁷;

R³ is a group represented by formula (A); and

R⁴ is hydrogen, a group represented by formula (A), or lower alkyl.

15. (Previously Presented) The compound of Claim 14, wherein

X is chloro or bromo;

Y is
$$-N(R^7)_2$$
;

 R^2 is hydrogen or C_1 - C_3 alkyl;

at most three R^6 are other than hydrogen as defined above; and at most three R^L are other than hydrogen as defined above.

16. (Previously Presented) The compound of Claim 15, wherein Y is -NH₂.

17. (Previously Presented) The compound of Claim 16, wherein

R4 is hydrogen;

at most one R^L is other than hydrogen as defined above; and

at most two R⁶ are other than hydrogen as defined above.

- 18. (Previously Presented) The compound of Claim 17, wherein x is O, NR⁷, C=O, CHOH, or C=N-R⁶.
- 19. (Previously Presented) The compound of Claim 17, wherein x represents a single bond.
- 20. (Previously Presented) The compound of Claim 1, wherein x is O, NR⁷, C=O, CHOH, or C=N-R⁶.
- 21. (Previously Presented) The compound of Claim 1, wherein x represents a single bond.
 - 22. (Previously Presented) The compound of Claim 1, wherein each R⁶ is hydrogen.
- 23. (Previously Presented) The compound of Claim 1, wherein at most two R⁶ are other than hydrogen as defined in Claim 1.
- 24. (Previously Presented) The compound of Claim 1, wherein one R⁶ is other than hydrogen as defined in Claim 1.
 - 25. (Previously Presented) The compound of Claim 1, wherein one R⁶ is -OH.
 - 26. (Previously Presented) The compound of Claim 1, wherein each R^L is hydrogen.

- 27. (Previously Presented) The compound of Claim 1, wherein at most two R^L are other than hydrogen as defined in Claim 1.
- 28. (Previously Presented) The compound of Claim 1, wherein one R^L is other than hydrogen as defined in Claim 1.
- 29. (Currently Amended) The compound of Claim 1, wherein x represents a single bond and the sum of o and p is 4 to 6.
 - 30. Canceled.
 - 31. Canceled.
- 32. (Currently Amended) The compound of Claim 1 31, which is in the form of a hydrochloride salt.
- 33. (Previously Presented) The compound of Claim 1, which is represented by the formula

- 34. (Previously Presented) The compound of Claim 33, which is in the form of a pharmaceutically acceptable salt.
- 35. (Previously Presented) The compound of Claim 34, which is in the form of a hydrochloride salt.
 - 36-41. Canceled.
- 42. (Previously Presented) The compound of Claim 1, which is represented by the formula

$$CI$$
 N
 NH
 NH
 NH
 NH
 NH
 O
 OH

- 43. (Previously Presented) The compound of Claim 42, which is in the form of a pharmaceutically acceptable salt.
- 44. (Previously Presented) The compound of Claim 43, which is in the form of a hydrochloride salt.

In reply to Office Action of September 12, 2003

45-47. Canceled.

- 48. (Previously Presented) The compound of Claim 1, which is in the form of a pharmaceutically acceptable salt.
- 49. (Previously Presented) A pharmaceutical composition, comprising the compound of Claim 1 and a pharmaceutically acceptable carrier.
 - 50. Canceled.
 - 51. (Canceled).
 - 52. (Previously Presented) A method of blocking sodium channels, comprising: contacting sodium channels with an effective amount of the compound of Claim 1.
 - 53-79. (Canceled).
 - 80. (Previously Presented) A composition, comprising: the compound of Claim 1; and a P2Y2 inhibitor.
 - 81. (Previously Presented) A composition, comprising: the compound of Claim 1; and

In reply to Office Action of September 12, 2003

a bronchodilator.

- 82. (New) The compound of Claim 1, which is in the form of a mesylate salt.
- 83. (New) A compound represented by formula (I):

$$\begin{array}{c|c}
X & 6 & N & 2 & NHR^1 & R^3 \\
Y & N & 3 & NHR^2 & R^4
\end{array}$$
(I)

wherein

X is hydrogen, halogen, trifluoromethyl, lower alkyl, unsubstituted or substituted phenyl, lower alkyl-thio, phenyl-lower alkyl-thio, lower alkyl-sulfonyl, or phenyl-lower alkyl-sulfonyl;

Y is hydrogen, hydroxyl, mercapto, lower alkoxy, lower alkyl-thio, halogen, lower alkyl, unsubstituted or substituted mononuclear aryl, or $-N(R^2)_2$;

R¹ is hydrogen or lower alkyl;

each R^2 is, independently, $-R^7$, $-(CH_2)_m$ -OR⁸, $-(CH_2)_m$ -NR⁷R¹⁰,

 $-(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8$, $-(CH_2CH_2O)_m-R^8$,

 $-(CH_{2}CH_{2}O)_{m}-CH_{2}CH_{2}NR^{7}R^{10}, -(CH_{2})_{n}-C(=O)NR^{7}R^{10}, -(CH_{2})_{n}-Z_{g}-R^{7}, -(CH_{2})_{m}-NR^{10}-R^{10}+R^{1$

 $CH_2(CHOR^8)(CHOR^8)_n$ - CH_2OR^8 , - $(CH_2)_n$ - CO_2R^7 , or

In reply to Office Action of September 12, 2003

$$-(CH_2)_n$$
 Q
 R^7
 R^7
 R^7

R³ and R⁴ are each, independently, hydrogen, a group represented by formula (A), lower alkyl, hydroxy lower alkyl, phenyl-lower alkyl, (halophenyl)-lower alkyl, lower-(alkylphenylalkyl), lower alkoxyphenyl)-lower alkyl, naphthyl-lower alkyl, or pyridyl-lower alkyl, with the proviso that at least one of R³ and R⁴ is a group represented by formula (A):

$$--(C(R^{L})_{2})_{\sigma}-x-(C(R^{L})_{2})_{p}-\langle Q-Q \rangle_{(R^{6})_{4}}^{Q-Q}$$
(A)

wherein

each R^L is, independently, -R⁷, -(CH₂)_n-OR⁸, -O-(CH₂)_m-OR⁸,

 $-(CH_2)_n-NR^7R^{10}, -O-(CH_2)_m-NR^7R^{10}, -(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8, \\$

-O-(CH₂)_m(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸, -(CH₂CH₂O)_m-R⁸,

-O- $(CH_2CH_2O)_m$ -R⁸, - $(CH_2CH_2O)_m$ -CH₂CH₂NR⁷R¹⁰,

 $-O-(CH_2CH_2O)_m-CH_2CH_2NR^7R^{10}$, $-(CH_2)_n-C(=O)NR^7R^{10}$,

 $-O-(CH_2)_m-C(=O)NR^7R^{10}, -(CH_2)_n-(Z)_g-R^7, -O-(CH_2)_m-(Z)_g-R^7,$

-(CH₂)_n-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

 $-\text{O-}(\text{CH}_2)_{\text{m}}\text{-}\text{NR}^{10}\text{-}\text{CH}_2(\text{CHOR}^8)(\text{CHOR}^8)_{\text{n}}\text{-}\text{CH}_2\text{OR}^8,$

In reply to Office Action of September 12, 2003

 $-(CH_2)_n$ - CO_2R^7 , $-O-(CH_2)_m$ - CO_2R^7 , $-OSO_3H$, -O-glucuronide, -O-glucose, or

$$-O\left(CH_2\right)_{m} O R^7$$
 or
$$-(CH_2)_{n} O R^7$$
;

each x is, independently, O, NR⁷, C=O, CHOH, C=N-R⁶, or represents a single bond;

each o is, independently, an integer from 0 to 10;

each p is, independently, an integer from 0 to 10;

with the proviso that (a) the sum of o and p in each contiguous chain is

from 1 to 10 when x is O, NR⁷, C=O, or C=N-R⁶ or (b) that the sum of o and p

in each contiguous chain is from 4 to 10 when x represents a single bond:

each R^6 is, independently, $-R^7$, -OH, $-OR^{11}$, $-N(R^7)_2$, $-(CH_2)_m$ - OR^8 ,

 $-O-(CH_2)_m-OR^8$, $-(CH_2)_n-NR^7R^{10}$, $-O-(CH_2)_m-NR^7R^{10}$,

 $-(CH_2)_n(CHOR^8)(CHOR^8)_n-CH_2OR^8$, $-O-(CH_2)_m(CHOR^8)(CHOR^8)_n-CH_2OR^8$,

 $-(CH_2CH_2O)_m-R^8$, $-O-(CH_2CH_2O)_m-R^8$, $-(CH_2CH_2O)_m-CH_2CH_2NR^7R^{10}$,

 $-O-(CH_2CH_2O)_m-CH_2CH_2NR^7R^{10}$, $-(CH_2)_n-C(=O)NR^7R^{10}$,

 $-O-(CH_2)_m-C(=O)NR^7R^{10}, -(CH_2)_n-(Z)_g-R^7, -O-(CH_2)_m-(Z)_g-R^7,$

-(CH₂)_n-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

-O-(CH₂)_m-NR¹⁰-CH₂(CHOR⁸)(CHOR⁸)_n-CH₂OR⁸,

-(CH₂)_n-CO₂R⁷, -O-(CH₂)_m-CO₂R⁷, -OSO₃H, -O-glucuronide, -O-glucose,

In reply to Office Action of September 12, 2003

$$-O\left(CH_2\right)_m O R^7$$
, or $-(CH_2)_n O R^7$;

wherein when two R^6 are -OR¹¹ and are located adjacent to each other on a phenyl ring, the alkyl moieties of the two R^6 may be bonded together to form a methylenedioxy group;

with the proviso that at least one R^6 is other than hydrogen as defined above; each R^7 is, independently, hydrogen or lower alkyl;

each R^8 is, independently, hydrogen, lower alkyl, -C(=O)- R^{11} , glucuronide, 2-tetrahydropyranyl, or

$$O \longrightarrow OR^{11}$$

$$O \longrightarrow OCOR^{11}$$

$$OCOR^{11}$$

$$OCOR^{11}$$

each R^9 is, independently, $-CO_2R^7$, $-CON(R^7)_2$, $-SO_2CH_3$, or $-C(=O)R^7$; each R^{10} is, independently, -H, $-SO_2CH_3$, $-CO_2R^7$, $-C(=O)NR^7R^9$, $-C(=O)R^7$, or $-CH_2$ -(CHOH)_n-CH₂OH; each Z is, independently, CHOH, C(=O), CHNR⁷R¹⁰, $C=NR^{10}$, or NR^{10} ;

In reply to Office Action of September 12, 2003

each R¹¹ is, independently, lower alkyl;

each g is, independently, an integer from 1 to 6;

each m is, independently, an integer from 1 to 7;

each n is, independently, an integer from 0 to 7;

each Q is, independently, C-R⁶;

or a pharmaceutically acceptable salt thereof, and

inclusive of all enantiomers, diastereomers, and racemic mixtures thereof.

- 84. (New) The compound of Claim 83, wherein Y is -NH₂.
- 85 (New) The compound of Claim 84, wherein R² is hydrogen.
- 86. (New) The compound of Claim 85, wherein R¹ is hydrogen.
- 87. (New) The compound of Claim 86, wherein X is chlorine.
- 88. (New) The compound of Claim 87, wherein R³ is hydrogen.
- 89. (New) The compound of Claim 88, wherein each R^L is hydrogen.
- 90. (New) The compound of Claim 89, wherein o is 4.
- 91. (New) The compound of Claim 90, wherein p is 0.
- 92. (New) The compound of Claim 91, wherein x represents a single bond.
- 93. (New) The compound of Claim 83, wherein X is halogen;

In reply to Office Action of September 12, 2003

Y is $-N(R^7)_2$;

R¹ is hydrogen or C₁-C₃ alkyl; and

 R^2 is $-R^7$, $-(CH_2)_m$ -OR⁷, or $-(CH_2)_n$ -CO₂R⁷;

R³ is a group represented by formula (A); and

R⁴ is hydrogen, a group represented by formula (A), or lower alkyl.

94. (New) The compound of Claim 93, wherein

X is chloro or bromo;

Y is $-N(R^7)_2$;

 R^2 is hydrogen or C_1 - C_3 alkyl;

at most three R^6 are other than hydrogen as defined above; and at most three R^L are other than hydrogen as defined above.

95. (New) The compound of Claim 94, wherein Y is -NH₂.

96. (New) The compound of Claim 95, wherein

R⁴ is hydrogen;

 R^6 .

at most one R^L is other than hydrogen as defined above; and at most two R^6 are other than hydrogen as defined above.

- 97. (New) The compound of Claim 96, wherein x is O, NR⁷, C=O, CHOH, or C=N-
 - 98. (New) The compound of Claim 96, wherein x represents a single bond.
- 99. (New) The compound of Claim 83, wherein x is O, NR⁷, C=O, CHOH, or C=N-R⁶.
 - 100. (New) The compound of Claim 83, wherein x represents a single bond.

In reply to Office Action of September 12, 2003

101. (New) The compound of Claim 83, wherein at most two R⁶ are other than hydrogen as defined in Claim 1.

- 102. (New) The compound of Claim 83, wherein one R⁶ is -OH.
- 103. (New) The compound of Claim 83, wherein each R^L is hydrogen.
- 104. (New) The compound of Claim 83, wherein at most two R^L are other than hydrogen as defined in Claim 83.
- 105. (New) The compound of Claim 83, wherein one R^L is other than hydrogen as defined in Claim 83.
- 106. (New) The compound of Claim 83, wherein x represents a single bond and the sum of o and p is 4 to 6.
 - 107. (New) The compound of Claim 83, which is in the form of a hydrochloride salt.
 - 108. (New) The compound of Claim 83, which is represented by the formula

$$\begin{array}{c|c} O & NH \\ \hline \\ CI & NH \\ NH & NH \end{array}$$

109. (New) The compound of Claim 108, which is in the form of a pharmaceutically acceptable salt.

In reply to Office Action of September 12, 2003

110. (New) The compound of Claim 109, which is in the form of a hydrochloride salt.

111. (New) The compound of Claim 83, which is represented by the formula

$$\begin{array}{c|c}
CI & N & HO & OH \\
NH & NH & NH
\end{array}$$

- 112. (New) The compound of Claim 111, which is in the form of a pharmaceutically acceptable salt.
- 113. (New) The compound of Claim 112, which is in the form of a hydrochloride salt.
- 114. (New) The compound of Claim 83, which is in the form of a pharmaceutically acceptable salt.
- 115. (New) A pharmaceutical composition, comprising the compound of Claim 83 and a pharmaceutically acceptable carrier.
 - 116. (New) A compound represented by the formula

in the form of a pharmaceutically acceptable salt.

- 117. (New) The compound of Claim 116, which is in the form of a hydrochloride salt.
 - 118. (New) The compound of Claim 116, which is in the form of a mesylate salt.
- 119. (New) A method of blocking sodium channels, comprising: contacting sodium channels with an effective amount of the compound of any one of Claims 2-11, 14-29, 32-35, 42-44, 48, and 82-118.
- 120. (New) A method of blocking sodium channels, comprising: contacting sodium channels with an effective amount of the composition of any one of Claims 49, 80, and 81.